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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/711,834	11/13/2000	Henrik Jakobsen	124-00100	7846

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EXAMINER

BLACKWELL RUDASIL, GWENDOLYN A

ART UNIT

PAPER NUMBER

1775

DATE MAILED: 12/19/2002

9

ease find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/711,834

Applicant(s)

JAKOBSEN ET AL.

Examiner

Gwendolyn A. Blackwell-Rudasill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 October 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 10-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 22-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

2. Applicant is advised that should claim 9 be found allowable, claim 25 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

3. Applicant is also advised that should claim 24 be found allowable, claim 25 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless –*

*(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.*

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C.

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122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1-2, 4, 7-9, 22-26, 28, and 31-33 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent no. 6,078,103, Turner.

Turner discloses electrical contacts between a metal and semiconductor surface. This type of contact is used in systems such as pressure sensors accelerometers, yaw rate sensors and micromotors, (column 1, lines 6-27). In an embodiment of this invention, a conductive trace is formed on the substrate with a pressure contact, such as a dimpled contact, that is formed on the conductive trace to attach the semiconductor element to the insulating substrate. The conductive trace can be formed of titanium by anodic bonding, (column 3, lines 1-32). In addition, the dimpled contact, attached to the conductive trace, (column 4, lines 50-53), for the attachment of the semiconductor device can be made of gold, (column 4, lines 64-65), having a thickness of approximately 2,000-5,000 angstroms, meeting the requirements of claims 1-2, 4, 7-8, and 22-23, (column 5, lines 2-5).

Turner also discloses that a mesa 32 is bonded to the insulating substrate by anodic bonding, which creates a sealed cavity, (column 5, lines 28-31). Figure 2 further illustrates that the mesa 32 encloses a portion of the conductive trace as well as the dimpled contact, meeting the requirements of claims 9, 24-26, 28, and 31-33

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are*

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*such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 3, 5-6, 27, and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent no. 6,078,103, Turner as applied to claims 1 and 25, in view of United States Patent no. 5,592,736, Akram et al.

Turner discloses the limitations of claims 1 and 25 above. Turner also discloses that the invention is used in systems such as pressure sensors accelerometers, yaw rate sensors and micromotors, (column 1, lines 6-27). In addition, the thickness of the conductive trace is to extend about 200-800 angstroms above the unetched portion of the insulating substrate, (column 4, lines 49-52). Turner does not specifically disclose a Ti/TiN layer structure as the first layer combination.

Akram et al disclose an interconnect structure for semiconductor component that has a raised contact site. An embodiment as shown in Figure 8A demonstrates that the conductive layer 66A is comprised of two layers 68 and 70. Layer 68 can be formed of a material such as platinum, titanium or titanium alloy, such as TiN. Layer 70 can be formed of aluminum, tungsten or titanium, (column 7, lines 32-56). In addition, the conductive layer 66A can be used

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as the conductive trace of Figure 9, wherein the conductive trace 72 include wire bonding sites 73 formed thereon, (column 8, lines 48-60).

Turner discloses dimpled contacts used to connect metal to semiconductor connections. While Akram et al disclose an interconnect structure used for semiconductor components. The inventions of Turner and Akram et al are analogous because both inventions use conductive lines and contact points in the manufacture of semiconductor components to create electrical connections. As such, it would be obvious to one skilled in the art at the time of invention to modify the conductive layer of Turner with the conductive layer of Akram et al to create a conductive trace that more readily bonds to the substrate of Turner through the enhanced bonding properties of the TiN/Ti conductive layer of Akram et al. Absent a showing of unexpected results to the contrary, it is reasonable for one skilled in the art to choose this combination, TiN/Ti, for the conductive layer with a reasonable expectation of success.

Although neither Turner nor Akram et al specifically disclose the thickness of the first layer, absent a showing of criticality, it would have been obvious to one skilled in the art at the time of invention through routine experimentation to optimize the thickness of the first layer according to the parameters as set forth by Turner, (column 4, lines 49-52). Thereby meeting the thickness variation as exemplified by applicant.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

United States Patent no. 5,591,679, disclose a sealed cavity on silicon wafer surfaces used in the manufacture of pressure sensors and force sensors, (column 1, lines 10-30). The


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piezoresistors are connected by aluminum interconnection lines to aluminum wire bonding pads, wherein the interconnection lines are located within boundary 17 of the sealed cavity, (columns 5-6, lines 49-7). Figure 12 (c) shows that buried conductor 42 have contacts 60 and 61 formed at each end of the conductor's surface, (column 7, lines 43-48). Figures 13 and 14 fully describe the configuration of the sealed cavity, (columns 7-8, lines 57-19).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gwendolyn A. Blackwell-Rudasill whose telephone number is (703) 305-9741. The examiner can normally be reached on Monday - Thursday; 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

  
Gwendolyn A. Blackwell-Rudasill  
Examiner  
Art Unit 1775

gbr  
December 16, 2002

  
DEBORAH JONES  
SUPERVISORY PATENT EXAMINER